

[P1] The use of 'webquests' to enhance blended learning environments

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Introduction

In the modern Higher Education environment increasing emphasis is placed on 'electronic learning' (e-learning) (Su *et al.*, 2005). This basically involves the use of information technology (IT) facilities to deliver learning material. Effective use of e-learning has been focused on distance learning with less information available for relating e-learning to a blended learning approach (Ellis *et al.*, 2006). The authors felt that previously e-learning was simply 'bolted on' to existing practice, rather than being fully integrated. This 'bolting on' approach has never been entirely successful, as students do not perceive where On-line Learning Tasks (OLTs) fit in with the module and do not take the tasks seriously (Hassanien, 2006). Instead students continue to rely heavily on receiving information from more traditional forms of delivery, such as lectures, workshops and tutorials.

The aim of this study was to harmonise e-learning with the more traditional styles of teaching that occur in the classroom or lecture theatre. This was to be done by trying to integrate information obtained from an OLT, which was completed during a period of student self-directed learning, with classroom activities.

Method

In a second year undergraduate pharmacology module, students normally receive three hours of taught classes each week, is supported by on-line access to lecture notes and workshops. In order to increase the effectiveness of the module's on-line facility towards the objectives of the course, two hours of the class that occurred in week five of the semester was dedicated to an unsupervised on-line task (OLT). This task was constructed in a way as to consolidate prior learning as well as to act as a preview to subsequent classes. The OLT was designed as a 'webquest' in which various medicinal drugs were concealed within a written scenario. The scenario did, however, contain hyperlinks to high quality pharmaceutical Internet sites and during the OLT, students were encouraged to study these sites and to apply the pharmacological knowledge they had already obtained from the module to the medications mentioned in the scenario. In addition to this, several of the drugs in the scenario were unfamiliar to the students, as they had not yet been covered on the module.

On completion of this OLT, students were expected to submit an electronic document that consisted of the names the concealed scenario medications, along with supplementary information on their use, mode of action and adverse reactions, all of which could be derived from the hyperlinked web-sites. Such documents enabled the module teaching team to monitor student engagement, as well as to encourage the students in producing a report that could prove to be a useful aid to learning key pharmacological principles covered in this and subsequent pharmacology modules. On completion of the module,

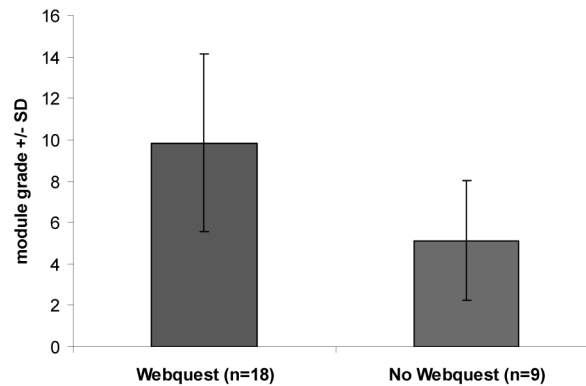


Figure 1: mean module grade +/- SD for self-selected student groups, one group engaging with the webquest activity and the other not engaging

students were asked to complete a reflective questionnaire about the effectiveness of the OLT as an aid to understanding the key principles of the module.

Results

As this was a student-directed activity, students could select whether or not they engaged with the OLT and as a consequence two independent groups were formed: students who engaged with the 'webquest' (n=18) and those who elected not to engage (n=9). Comparison of the assessment performance as shown by the mean module grade (**Figure 1**) was carried out using an independent T-test. A significantly higher mean module grade was noted for those students engaging with the 'webquest' when compared to those who elected not to engage ($p < 0.05$).

Discussion

This OLT uses a scenario from which students were expected to seek pharmacological information that reinforces the knowledge they have already obtained from the module. It also serves as an introduction to new learning material that is set to follow. The scenario itself was deliberately written in an approachable style to make it accessible for a diverse student cohort. It was set in a non-scientific context, ensuring that it contained no off putting technical or biomedical terminology so as not to dissuade even the least able students from approaching the OLT. In addition to this, such a scenario emphasises the concept that the subject of pharmacology is not just restricted to the classroom or laboratory, but that it routinely occurs in everyday life. Engagement with the 'webquest' is associated with improved assessment performance (**Figure 1**) with students who engaged with the 'webquest' achieving on average a higher module grade ($p < 0.05$).

This 'webquest' was designed to provide a thorough self-directed learning experience into the fundamentals of pharmacodynamics by explaining and integrating the interaction of drugs at the different levels of cellular and tissue organisation. On completion of the 'webquest' students had been given the opportunity to explore the relationship between the actions of drugs at their molecular targets and their efficacy in achieving pharmacological effects. Students encountered the quantitative analysis required to relate the way in which drugs may lead to therapeutic or toxic responses. In accomplishing this work, the OLT has been converted from merely gathering information into a more challenging exercise. To meet the goal of having to produce a document that relates all the

underlying principles of pharmacology to the way in which medicinal drugs are used, students are required to apply newly acquired knowledge to formulate their own opinions on unfamiliar classes of drugs. In this way students are guided towards the qualitative phases of relational and maybe even extended abstract thinking of Biggs' SOLO taxonomy (Biggs, 2004 p48). Further to this, since student responses to the 'webquest' are expected to come in the form of reasoned written descriptions, this will encourage students to transform declarative knowledge to functioning knowledge, underpinning the qualitative stages of learning.

Conclusion

This OLT has been designed to create a student-centred on-line learning environment that is constructively aligned (Biggs, 2002) with the learning outcomes of the module. By setting a series of progressive targets within this task, starting simply and increasing in complexity, it is envisaged that the work being set was something that could be approached by all students on the module. By integrating an OLT with face-to-face activities, students engaged more fully with e-learning within a blended learning environment. As a result e-learning can be used effectively as a method for stimulating the acquisition and transformation of knowledge by students. The results from this OLT were positive, suggesting that this form of e-learning can be used as an integral support tool within a blended learning environment.

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